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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,104	01/28/2000	Ken Yoshioka	503.38156X00	1799

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EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 11/20/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/493,104

Applicant(s)

YOSHIOKA ET AL.

Examiner

Allan W. Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 12-23 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-8 and 13-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 4 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. An oral translation from the foreign language services division of the PTO library translated the original Japanese priority document in a similar manner to that of the original English language disclosure. Specifically, "Fluorine nitric acid". The examiner does not yet understand what compound this is intended to be. However, the translator did say that the "hydrofluoric or nitric acid" recitation of the amendment filed Sept. 9, 2002 is not what the original Japanese document discloses. Therefore this is considered to be new matter.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 19 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by.

~~O'Donnell teaches a method of etching a metal layer, such as the NiFe alloy~~
used in the fabrication of read/write magnetic heads. O'Donnell teaches plasma etching of a metal layer that is disposed beneath an etching mask, for example a photoresist or a hard mask. After the plasma etching, O'Donnell teaches rinsing the substrate to remove residual material, which if not removed would lead to corrosion of the metallic layer. See: column 1; column 2, lines 58-64; column 4, lines 38-40.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,069,035 issued to O'Donnell et al. (hereinafter, O'Donnell) in view of U.S. Patent 5,269,878 issued to Page et al. (hereinafter, Page)

O'Donnell teaches a method of etching a layer comprising a transition metal, such as PERMALLOYTM. O'Donnell's uses a plasma containing chlorine and argon to etch the metal layer while the temperature of the substrate support is maintained at 40°C. Following the chlorine etch step O'Donnell teaches a second step of rinsing the substrate with 90° C deionized water in order to remove chlorine residue from the etched substrate. O'Donnell teaches that the metal layer may be patterned by etching through a patterned photoresist mask. See: column 1, lines 10-20, 30-35, 62-65; column 5, 21-25; column 6, lines 34-35; column 5, line 66 – column 7, line 34.

O'Donnell does not teach using a hot plate to dry the substrate after it has been rinsed with water.

Page teaches drying the substrate with a hot plate after it has been rinsed with water.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell and Page as applied to claim 1 above, and further in view of U.S. Patent 5,520,716 issued to Takagi et al. (hereinafter, Takagi).

Claim 8 is dependent upon claim 1. O'Donnell teaches the limitations of claim 1 as noted in the above rejection. Additionally, it is noted that O'Donnell teaches that the method finds utility in the fabrication of magnetic heads. See column 1, lines 19-22 and column 7, lines 28-32.

O'Donnell does not teach that the PERMALLOY™ layer being etched is on a sintered $\text{Al}_2\text{O}_3/\text{TiC}$ substrate.

Takagi teaches a sintered $\text{Al}_2\text{O}_3/\text{TiC}$ substrate for magnetic heads.

It would have been obvious to one skilled in the art to use a sintered $\text{Al}_2\text{O}_3/\text{TiC}$ substrate when applying O'Donnell's method to the fabrication of a magnetic head because the sintered $\text{Al}_2\text{O}_3/\text{TiC}$ substrate of Takagi the fabrication of magnetic heads that have excellent smoothness. Also the head may be manufactured with high precision thereby proving heads with improved reliability.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,282,776 issued to Otsuka et al. (hereinafter, Otsuka) in view of O'Donnell and further in view of Page.

Otsuka teaches a method of fabricating a magnetic head comprising each of the component layers recited in the instant claims (i.e. an upper pole made from an a NiFe alloy, a seed layer, a gap layer and a NiFe alloy lower pole/shield layer). Otsuka's method includes etching the seed layer and then plasma etching the gap layer with a Cl or F containing gas. See column 15, line 61 - column 16, line 21.

Otsuka does not teach removing chlorine or fluorine residue with a liquid rinse.

O'Donnell teaches removing chlorine or fluorine residue with a liquid rinse.

It would have been obvious to one skilled in the art to removing chlorine or fluorine residue from the structure of Otsuka by applying a liquid rinse as taught by O'Donnell because O'Donnell teaches that corrosion is prevented by removing the chlorine and fluorine residues with a liquid rinse.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates.

Claims 13, 15-18, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka in view of O'Donnell and Page and further in view of U.S. Patent 5,607,599 issued to Ichihara et al. (hereinafter, Ichihara).

Otsuka teaches a method of fabricating a magnetic head comprising each of the component layers recited in the instant claims (i.e. an upper pole made from an a NiFe alloy, a seed layer, a gap layer and a NiFe alloy lower pole/shield layer). Otsuka's

method includes etching the seed layer and then plasma etching an oxide gap layer with a Cl or F containing gas. See column 15, line 61 - column 16, line 21.

Otsuka does not teach removing chlorine or fluorine residue with a liquid rinse.

O'Donnell teaches removing chlorine or fluorine residue with a liquid rinse.

It would have been obvious to one skilled in the art to removing chlorine or fluorine residue from the structure of Otsuka by applying a liquid rinse as taught by O'Donnell because O'Donnell teaches that corrosion is prevented by removing the chlorine and fluorine residues with a liquid rinse.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates.

Otsuka does not teach plasma etching the seed or shield layers with argon and chlorine.

Ichihara teaches etching NiFe alloy layers such as seed and shield layers with an argon and chlorine plasma. See column 4, lines 27-48

It would have been obvious to one skilled in the art to use the plasma etching method of Ichihara because Ichihara teaches that the use of Ar and BCl₃ allows one to obtain a high degree of etching selectivity between the various layers of the magnetic head as well as providing a means of fabricating the a magnetic head while maintaining a low processing temperature.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633.

The examiner's Right-Fax (direct to desktop) phone number is 703-872-9684. Alternatively, the general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.
November 18, 2002

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